

Compact Flash GPS User Manual

GPS GCF508

Version 1.01 2004 / 1 0 / 0 5

INDEX

1	OVERVIEW	3
2	PRODUCT FEATURE	3
3	HARDWARE	4
3.1.	DIMENSION.....	4
3.2.	HARDWARE INTERFACE	4
3.3	LED & EXTERNAL ANTENNA	5
4.	SOFTWARE DATA.....	5
4.1.	NMEA OUTPUT MESSAGE.....	5
4.2.	GLOBAL POSITIONING SYSTEM FIX DATA (GGA)	5
4.3.	GEOGRAPHIC POSITION WITH LATITUDE/LONGITUDE(GLL).....	6
4.4.	GNSS DOP AND ACTIVE SATELLITES (GSA).....	7
4.5.	GNSS SATELLITES IN VIEW (GSV).....	8
4.5.	RECOMMENDED MINIMUM SPECIFIC GNSS DATA (RMC)	9
4.6.	COURSE OVER GROUND AND GROUND SPEED (VTG)	9
4.7.	RTCM RECEIVED DATA--OPTIONAL	10
5.	WARRANTY	10
6.	INSTALLATION.....	11
7	TROUBLESHOOTING	13

1 OVERVIEW

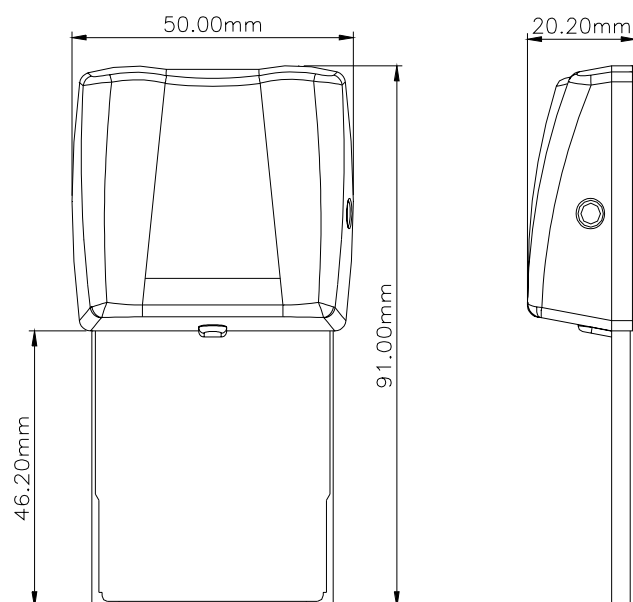
Congratulation on your purchase of Altina, which manufacture and provide various GPS applications. Altina's **GCF508** receiver is deigned with Compact Flash type interface, built-in active antenna for high sensitivity to tracking signal and based on the SiRF star /LP low power chipset to support all function. Indeed, **GCF508** is well suited to system integration and users who use PDA, notebook PC. It satisfies a wide variety of applications for car navigation, personal navigation or touring devices, tracking and marine navigation purpose. Users can simply plug it into a PDA or other type of handheld PC running with suitable mapping and routing software for navigation.

2 PRODUCT FEATURE

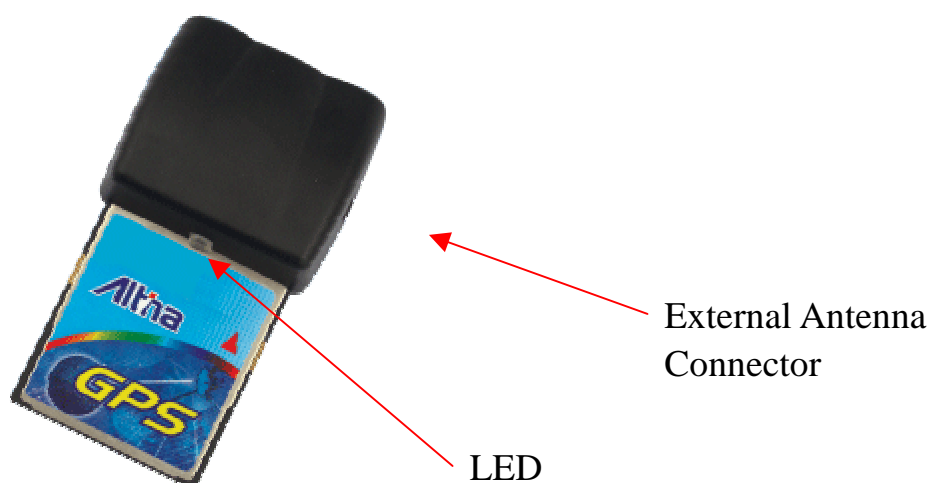
- SiRF Star e/LP "High Performance and Low Power Consumption Chipset
- 12 parallel satellite-tracking channels for fast acquisition and reacquisition.
- High speed signal acquisition using 1920 time/frequency search channels.
- Built-in hardware Tracking Loop Processor WAAS/EGNOS Demodulator
- Built-in rechargeable battery for memory and RTC backup and for fast Time to First Fix(TTFF)。
- Support NMEA0183 v2.2 data protocol and SiRF binary code。
- Trickle Power Enabled for Power Saving
- Enhanced algorithms -SnapLock and SnapStart provide superior navigation performance in urban, canyon and foliage environments.
- Support CF card type I connector suitable PDA, Hand Held PC or PC device.。

3 HARDWARE

3.1. Dimension



3.2. Hardware Interface



3.3 LED & External Antenna

➤ LED

LED OFF	GCF508 CF GPS Receiver Switch Off.
LED ON	GCF508 CF GPS Receiver Signal Searching.
LED Flashing	GCF508 CF GPS Receiver Signal Position Fixed.

➤ External Antenna Connector (MCX) --Optional

As using GCF508 CF GPS Receiver in a RV car, truck or bus, it might receive poor signals through limited view to the sky. Replace the foldable antenna with the active one can get better satellite signals. Windshields with heavy tinted or likewise may interfere with signal receiving. An active antenna then becomes essential.

4. SOFTWARE DATA

- NMEA 0183 V2.2 Protocol
- Use CF card type I : 4800 bps, 8 bit data, 1 stop bit and no parity.

4.1. NMEA Output Message

Table 4-1 NMEA-0183 Output Messages

NMEA Record	Description
GPGLL	Global positioning system fixed data
GPGLL	Geographic position: latitude/longitude
GPGLL	GNSS DOP and active satellites
GPGLL	GNSS satellites in view
GPGLL	Recommended minimum specific GNSS data
GPGLL	Course over ground and ground speed

4.2. Global Positioning System Fix Data (GGA)

Table 4-2 contains the values for the following example

\$GPGLL,161229.487,3723.2475,N,12158.3416,W,1,07,1.0,9.0,M, , , ,0000*18

Table 4-2 GGA Data Format

Name	Example	Units	Description
Message ID	\$GPGGA		GGA protocol header
UTC Time	161229.487		hhmmss.sss
Latitude	3723.2475		ddmm.mmmm
N/S Indicator	N		N=north or S=south
Longitude	12158.3416		dddmm.mmmm
E/W Indicator	W		E=east or W=west
Position Fix Indicator	1		See Table 5-3
Satellites Used	07		Range 0 to 12
HDOP	1.0		Horizontal Dilution of Precision
MSL Altitude	9.0	Meters	

Table 4-3 GGA Data Format-continue

Name	Example	Units	Description
Units	M	Meters	
Geoid Separation		Meters	
Units	M	Meters	
Age of Diff. Corr.		second	Null fields when DGPS is not used
Diff. Ref. Station ID	0000		
Checksum	*18		
<CR> <LF>			End of message termination

Table 4-4 Position Fix Indicator

Value	Description
0	0 Fix not available or invalid
1	GPS SPS Mode, fix valid
2	Differential GPS, SPS Mode, fix valid
3	GPS PPS Mode, fix valid

4.3. Geographic Position with Latitude/Longitude(GLL)

Table 4-5 contains the values for the following example.

\$GPGLL,3723.2475,N,12158.3416,W,161229.487,A*2C

Table 4-5 GLL Data Format

Name	Example	Units	Description
Message ID	\$GPGLL		GLL protocol header
Latitude	3723.2475		ddmm.mmmm
N/S Indicator	N		N/S Indicator N N=north or S=south
Longitude	12158.3416		dddmm.mmmm
E/W Indicator	W		E=east or W=west
UTC Position	161229.487		hhmmss.sss
Status	A		A=data valid or V=data not valid
Checksum	*2C		
<CR> <LF>			End of message termination

4.4. GNSS DOP and Active Satellites (GSA)

Table 4-6 contains the values for the following example.

\$GPGSA,A,3,07,02,26,27,09,04,15, , , , ,1.8,1.0,1.5*33

Table 4-6 GSA Data Format

Name	Example	Units	Description
Message ID	\$GPGSA		GSA protocol header
Mode 1	A		See Table 5-6
Mode 2	3		See Table 5-7
Satellite Used(1)	07		Sv on Channel 1
Satellite Used(1)	02		Sv on Channel 2
Satellite Used			Sv on Channel 12
PDOP	1.8		Position Dilution of Precision
HDOP	1.0		Horizontal Dilution of Precision
VDOP	1.5		Vertical Dilution of Precision
Checksum	*33		
<CR> <LF>			End of message termination

NOTE: Satellite used in solution.

Table 4-7 Mode 1

Value	Description
M	Manual—forced to operate in 2D or 3D mode
A	2DAutomatic—allowed to automatically switch 2D/3D

Table 4-8 Mode 2

Value	Description
1	Fix Not Available
2	2D
3	3D

4.5. GNSS Satellites in View (GSV)

Table 4-9 contains the values for the following example

\$GPGSV,2,1,07,07,79,048,42,02,51,062,43,26,36,256,42,27,27,138,42*71

\$GPGSV,2,2,07,09,23,313,42,04,19,159,41,15,12,041,42*41

Table 4-9 GSV Data Format

Name	Example	Units	Description
Message ID	\$GPGSV		GSV protocol header
Number of Messages	2		Range 1 to 3
Message Number	1		Range 1 to 3
Satellites in View	07		Range 1 to 12
Satellite ID	07		Channel 1 (Range 1 to 32)
Elevation	79	degrees	Channel 1 (Maximum 90)
Azimuth	048	degrees	Channel 1 (True, Range 0 to 359)
SNR (C/No)	42	dBHz	Range 0 to 99, null when not tracking
Satellite ID	27		Channel 4 (Range 1 to 32)
Elevation	27	degrees	Channel 4 (Maximum 90)
Azimuth	138	degrees	Channel 4 (True, Range 0 to 359)
SNR (C/No)	42	dBHz	Range 0 to 99, null when not tracking
Checksum	*71		
<CR> <LF>			End of message termination

NOTE: Items <4>,<5>,<6> and <7> repeat for each satellite in view to a maximum of four (4) satellites per sentence. Additional satellites in view information must be sent in subsequent sentences. These fields will be null if unused.

4.5. Recommended Minimum Specific GNSS Data (RMC)

Table 4-10 contains the values for the following example.

\$GPRMC,161229.487,A,3723.2475,N,12158.3416,W,0.13,309.62,120598, ,*10

Table 4-10 RMC Data Format

Name	Example	Units	Description
Message ID	\$GPRMC		RMC protocol header
UTC Time	161229.487		hhmmss.sss
Status	A		A=data valid or V=data not valid
Latitude	3723.2475		ddmm.mmmm
N/S Indicator	N		N=north or S=south
Longitude	12158.3416		dddmm.mmmm
E/W Indicator	W		E=east or W=west
Speed Over Ground	0.13	knots	
Course Over Ground	309.62	degrees	True
Date	120598		ddmmyy
Magnetic Variation(1)		degrees	E=east or W=west
Checksum	*10		
<CR> <LF>			End of message termination

NOTE: SiRF Technology Inc. does not support magnetic declination. All “course over ground” data are geodetic WGS84 directions.

4.6. Course Over Ground and Ground Speed (VTG)

Table 4-11 contains the values for the following example.

\$GPVTG,309.62,T, ,M,0.13,N,0.2,K*6E

Table 4-11 VTG Data Format

Name	Example	Units	Description
Message ID	\$GPVTG		VTG protocol header
Course	309.62	degrees	Measured heading
Reference	T		True

Course		degrees	Measured heading
Reference	M		Magnetic(1)
Speed	0.13	knots	Measured horizontal speed
Units	N		Knots
Speed	0.2	km/hr	Measured horizontal speed
Units	K		Kilometers per hour
Checksum	*6E		
<CR> <LF>			End of message termination

NOTE: SiRF Technology Inc. does not support magnetic declination. All “course over ground” data are geodetic WGS84 directions.

4.7. RTCM Received Data--optional

The default communication parameters for DGPS Input are 4800 baud, 8 data bits, stop bit, and no parity. Position accuracy of less than 5 meters can be achieved with the **GCF508** by using Differential GPS (DGPS) real-time pseudo-range correction data in RTCM SC-104 format, with message types 1, 2 or 9. As using DGPS receiver with different communication parameters, **GCF508** may decode the data correctly to generate accurate messages and save them in battery-back SRAM for later computing.

5. Warranty

A) Device: Altina warrants to the original end user (“Customer”) that new Altina branded products will be free from defects in workmanship and materials, under normal use, for one year if you are a purchaser in North America, Central America, and South America; 2 years if you are a purchaser in a EU member state that has enacted into national law the EU Directive on Consumer Guarantees (99/44/EC) from the original purchase date. At the time of service, the owner will need to be able to provide evidence of date and place of purchase and serial number.

B) Exclusions: This warranty excludes (1) physical damage to the surface of the product; (2) damage caused by misuse, neglect, improper installation or testing, unauthorized attempts to open, repair, or modify the product, or any other cause beyond the range of the intended use; (3) damage caused by accident, fire, power changes, other hazards, or acts of God; or (4) use of the product with any non-Altina device or service if such device or service caused the problem.

Any third party products, including software, included with Altina products are not covered by this Altina warranty and Altina makes no representations or warranties on behalf of such

third parties. Any warranty on such products is from the supplier or licensor of the product.

C) Exclusive remedies: Should a covered defect occur during the warranty period and you notify Altina, your sole and exclusive remedy shall be, at Altina's sole option and expense, to repair or replace the product. If Altina cannot reasonably repair nor replace then Altina may, in its sole discretion, refund the purchase price paid for the product. Replacement products or parts may be new or reconditioned or comparable versions of the defective item.

D) Obtaining warranty service: Dated proof of original purchase will be required. Products or parts shipped by Customer to Altina must be sent postage-paid and packaged appropriately for safe shipment. Altina is not responsible for Customer products received without a warranty service authorization and may be rejected. Repaired or replacement products become the property of Altina.

WARRANTIES EXCLUSIVE: THE FOREGOING WARRANTIES AND REMEDIES ARE EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OF IMPLIED, INCLUDING WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, CORRESPONDENCE WITH DESCRIPTION, AND NON-INFRINGEMENT, ALL OF WHICH EXPRESSLY DISCLAIMED.

LIMITATION OF LIABILITY: NEITHER ALTINA NOR ITS SUPPLIERS SHALL BE LIABLE FOR INCIDENTAL, CONSEQUENTIAL, INDIRECT, SPECIAL, OR PUNITIVE DAMAGES OF ANY KIND, LOSS OF INFORMATION OR DATA, OR OTHER FINANCIAL LOSS ARISING OUT OF OR IN CONNECTION WITH THE SALE OR USE OF THIS PRODUCTS, WHETHER BASED IN CONTRACT, TORT (INCLUDING NEGLIGENCE) OR ANY OTHER THEORY, EVEN IF ALTINA HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. ALTINA'S ENTIRE LIABILITY SHALL BE LIMITED TO REPLACEMENT, REPAIR, OR REFUND OF THE PURCHASE PRICE PAID, AT ALTINA'S OPTION.

6. INSTALLATION

The GCF508 GPS supports plug and play.

For PDA

- Plug in GCF508 GPS into your PDA equipped with Compact Flash interface.
- Running the suitable mapping/navigation software and select the correct COM port & baud rate: 4800,N,8,1.



For Notebook

- Plug in GCF508 into PCMCIA card slot of notebook PC through general Compact Flash to PCMCIA adapter.
- Install the “Compact Flash to PCMCIA” drivers for WIN98, 2000, XP
- Running the suitable mapping/navigation software and select the correct COM port & baud rate: 4800,N,8,1.



7 Troubleshooting

Problem	Reason	Solution
No position output but timer is counting	Weak or no GPS signal can be received at the place of GCF-508 CF GPS	Connect an external antenna which locate as a open space to your GCF-508 CF GPS and then press Reset Button
	At outdoor space but GPS signal is blocked by buildings or car roof.	Go outdoor and press Reset Button to try again, or connect an external antenna to improve the poor GPS signal.
Execute Fail	Wrong CPU Type	Pocket PC support multiple types of CPU. Make sure you download the correct software. (You can use 'setting' function of start menu on your PDA to check the correct CPU type)
Can't Open COM port	GCF-508 CF GPS is not inserted or some other application is using the COM port.	Insert GCF-508 CF GPS or Close all other applications that using the COM port.
Can't Find GPS Module	Poor connection	Check the GCF-508 CF GPs is inserted correctly.
No signal	No action for few minutes may cause Pocket PC entry power save mode. It will close the COM port at the same time.	Close the application and execute it again to reopen the COM port.
	Weak or no GPS signal when using GCF-508 CF GPS indoor.	Connect an external antenna to your GCF-508 CF GPS and place it at a open space, then press Reset button.